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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/742,433	12/22/2000	Tomoyuki Hiroki	35.G2698	8881

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EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 02/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/742,433

Applicant(s)

HIROKI, TOMOYUKI

Examiner

Rudy Zervigon

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 16 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on December 16, 2002. These drawings are accepted.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshinao Miyata (USPat. 5,992,974). Yoshinao Miyata teaches a method ("Detailed Description") of manufacturing a liquid jet recording head (Fig.5h') which comprises an element substrate ("silicon monocrystal"; 40; Figures 5(a)-5(h); column 6, lines 21-28) provided with a plurality of discharge energy generating elements (44, 47, 45; column 6, lines 47-50) for applying discharge energy (column 3, lines 34-41) to a recording liquid in accordance with image data (column 2, lines 13-45, abstract). Yoshinao Miyata further teaches:

- i. a liquid chamber (2, all Figures where shown)
- ii. a top plate (6, Fig.1(a), 2, 5(h)) having a plurality of nozzles (7) and made from silicon wafer having a <110> orientated surface (column 3, lines 41-48)
- iii. the top plate and the element substrate are "jointed" (column 7, lines 49-53) so that each of the discharge energy generating elements face the respective nozzle (7, Figure 5(h))

Yoshinao Miyata further teaches:

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- iv. a mask layer ("protecting layer", 41; column 8, lines 20-27) provided on a nozzle surface (lower surface of 6, Figure 5(a) and 5(h)) of the top plate
- v. compensation patterns (7,2) extending to a liquid chamber region (2) in order to from the nozzles and the liquid chamber by anisotropic etching (claim 8; column 5, lines 17-23)
- vi. steps for performing anisotropic etching of the top plate through the mask layer and forming the liquid chamber to have a substantially rectangular shape at the nozzle surface of the top plate by over-etching portions with the compensation patterns – column 7, line 65 – column 8, line 6

Yoshinao Miyata further teaches:

- vii. compensation patterns (61,7,51; Fig.7(a)) are comb-shaped (Figure 7(a)) and are arranged to oppose each other so as to define a ladder-shaped opening region between the compensation patterns at the center portion (7) of the liquid chamber region
- viii. compensation patterns (61,7,51; Fig.7(a)) are arranged to oppose each other so as to define a substantially H-shaped opening region between the compensation patterns at the center portion (7) of the liquid chamber region

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshinao Miyata (USPat. 5,992,974), as applied to claims 1-4 above. Yoshinao Miyata does not teach "lines" having an angles of 55° and 71° relative to the <111> plane in the nozzle direction of the silicon wafer. However Yoshinao Miyata does teach "lines" having an angles of 35° relative to the <111> plane in the nozzle direction of the silicon wafer (column 3, line 64).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Yoshinao Miyata to increase the 35° (column 3, line 64) angle to 55° and 71° that is relative to the <111> plane in the nozzle direction of the silicon wafer.

Motivation for Yoshinao Miyata to increase the 35° (column 3, line 64) angle to 55° and 71° that is relative to the <111> plane in the nozzle direction of the silicon wafer is drawn to the level of skill in the art whereby increasing the increase the 35° angle to 55° and 71° that is relative to the <111> plane in the nozzle direction of the silicon wafer would increase the flow rate of the ejected ink.

Response to Arguments

6. Applicant's arguments filed December 16, 2002 have been fully considered but they are not persuasive. Applicant's states that Yoshinao Miyata does not teach "over-etching portions of the compensation pattern" as supported by Applicant's specification (page 16, lines 19 - page 17, line 6). Applicant states that such over-etching produces portions (14, Figure 2A,2B) of the compensation pattern (10, Figure 2A) closest to the nozzles (3) that are angled. The Examiner

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asserts that Yoshinao Miyata teaches the result of the method of "over-etching" of the compensation pattern (61, 7; Figure 7(a,b); column 8, line 56 – column 9, line 27). Specifically, Yoshinao Miyata teaches Applicant's "over-etching" that produces portions (tapered sections of 61, Figure 7B) of the compensation pattern (61) closest to the nozzles (7) that are angled.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

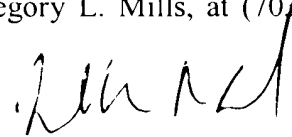
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to

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the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.



JEFFRIE R. LUND
PRIMARY EXAMINER